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| 10/030,593 | 10/29/2002 | Robert Lance Cook | 25791.25.08 | 2137 |

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| EXAMINER |
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THOMPSON, KENNETH L

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| ART UNIT | PAPER NUMBER |
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3672

DATE MAILED: 03/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/030,593

Applicant(s)

COOK ET AL

Examiner

Kenn Thompson

Art Unit

3672

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 November 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-61, 64-66, 68-77, 79-84 and 86-120 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 34-61 and 99-120 is/are allowed.
- 6) ☒ Claim(s) 1-12, 14-20, 26, 27, 65, 68, 73, 74, 76, 79, 83, 86 and 89-98 is/are rejected.
- 7) ☒ Claim(s) 13, 21-25, 28-33, 64, 66, 69-72, 75, 77, 80-82, 84, 87 and 88 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 23/05 8/17, 19/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3 and 65, 68, 73, 74, 76, 79, 83 and 86 are rejected under 35 U.S.C. 102(b) as being anticipated by Abdrakhmanov et al., U.S. 5,083,608.

Regarding claim 1, Abdrakhmanov et al. discloses in figures 1-8 an expandable tubular member. Abdrakhmanov et al. discloses a first tubular section (upper 2) having a first outer diameter comprising a first threaded connection. Abdrakhmanov et al. discloses an intermediate tubular section coupled to the first tubular section having an intermediate outer diameter. Abdrakhmanov et al. discloses a second tubular section (lower 2) having a second outer diameter coupled to the intermediate tubular section having a second outer diameter comprising a second threaded connection; wherein the first and second outer diameters are greater than the intermediate outer diameter; and wherein the burst strength of the first and second tubular sections is substantially equal to the burst strength of the intermediate section.

Regarding claim 2, Abdrakhmanov et al. discloses a method of fabricating an expandable tubular member. Abdrakhmanov et al. discloses a tubular member having a first end (2), a second end (2), and an intermediate portion (6). Abdrakhmanov et al. discloses in figure 1 radially expanding the first end and the second end of the tubular member. Abdrakhmanov et al. discloses forming a first threaded connection on the first end of the tubular member; and forming

Art Unit: 3672

a second threaded connection on the second end of the tubular member; and wherein the burst strength of the first and second tubular sections is substantially equal to the burst strength of the intermediate section.

Regarding claim 3, Abdrakhmanov et al. discloses a tubular member (2) formed by the process of radially expanding an unexpanded tubular member into contact with an approximately cylindrical passage using an expansion cone (20'). Abdrakhmanov et al. discloses the unexpanded tubular member including a first tubular section (upper 2) having a first outer diameter comprising a first threaded connection (4); an intermediate tubular section coupled to the first tubular section having an intermediate outer diameter; and a second tubular section (lower 2) having a second outer diameter coupled to the intermediate tubular section having a second outer diameter comprising a second threaded connection; wherein the first and second outer diameters are greater than the intermediate outer diameter and wherein the burst strength of the first and second tubular sections is substantially equal to the burst strength of the intermediate section.

As to claims 65 and 83, Abdrakhmanov et al. discloses a first tubular (upper 2) transitional member coupled between the first tubular section and the intermediate tubular section (between ends 2); and a second tubular transitional member coupled between the second tubular section (lower 2) and the intermediate tubular section. Abdrakhmanov et al. discloses the angles of inclination of the first and second tubular transitional members relative to the intermediate tubular section ranges from about 0 to 30 degrees (transition angles of 2 relative to the longitudinal axis of thereof starting from threaded section 3 and 4 to the intermediate portion between expanded ends 2 will become greater than 0 degrees).

As to claims 68, 79 and 86, Abdrakhmanov et al. discloses the first threaded connection (upper 3,4) comprises an internally threaded connection (4); and the second threaded connection (lower 3,4) comprises an externally threaded connection (3).

As to claim 73, Abdrakhmanov et al. discloses applying a protective coating (5) onto the radially expanded first and second ends of the tubular member (5 covers cylindrical portion 2).

As to claim 74, Abdrakhmanov et al. discloses applying a coating of a sealant (7) onto the intermediate portion (6) of the tubular member.

As to claim 76, Abdrakhmanov et al. discloses a first tubular transitional member between the first end (upper end of 2) and the intermediate portion of the tubular member; and forming a second tubular transitional member between the second end (lower end 2) and the intermediate portion of the tubular member; wherein the angles of inclination of the first and second tubular transitional members relative to the intermediate portion ranges from about 0 to 30 degrees. (transition angles of 2 relative to the longitudinal axis of thereof starting from threaded section 3 and 4 to the intermediate portion between expanded ends 2 will become greater than 0 degrees).

Claims 4-6, 93 and 94 are rejected under 35 U.S.C. 102(b) as being anticipated by Simpson, WO 00/37766.

Regarding claims 4-6, Simpson discloses in figures 9-17 a method of joining a first tubular member (202) to a second tubular member (200). Simpson discloses positioning at least a portion of the second tubular member within the first tubular member. Simpson discloses radially expanding at least a portion of the second tubular member into contact with the first tubular member. Simpson discloses in figure 12 radially expanding the first and second tubular

Art Unit: 3672

members; wherein the interior diameter of the radially expanded second tubular member is substantially equal to the interior diameter of the radially unexpanded portion of the first tubular member.

Regarding claims 93 and 94, Simpson discloses positioning a first wellbore casing (202) within the borehole; coupling the first wellbore casing to the borehole (page 23, lines 22-30). Simpson discloses positioning a second wellbore casing (200) within the borehole, overlapping at least a portion of the second wellbore casing with the first wellbore casing. Simpson discloses radially expanding at least a portion of the second wellbore casing into contact with the first wellbore casing. Simpson discloses interior diameter of the radially expanded portion of the second wellbore casing is substantially equal to the radially unexpanded portion of the first wellbore casing.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 7 is rejected under 35 U.S.C. 102(b) as being anticipated by Nobileau, U.S. 5,794,702.

Regarding claim 7, Nobileau discloses in figures 1-19 a first tubular member (11); a second tubular member (15c) positioned in overlapping relation to the first tubular member. Simpson discloses an expansion mandrel (31) positioned within the first tubular member

Art Unit: 3672

including one or more outer surfaces for radially expanding the first and second tubular members. Simpson discloses a support member (72) coupled to the expansion mandrel for supporting the expansion mandrel. Simpson discloses a first fluid conduit (29) positioned within the expansion mandrel and the support member. Simpson discloses a packer (71) sealingly coupled to the first tubular member and slidingly and sealingly coupled to the support member. Simpson discloses a second fluid conduit (73) coupled to the packer; and a pump (P) fluidically coupled to the second fluid conduit.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 8-12, 14-20, 26, 27, 89-92 and 95-98 are rejected under 35 U.S.C. 102(b) as being anticipated by Kinley, U.S. 3,191,677.

Regarding claim 8, Kinley discloses in every embodiment with exception of the one shown in figure 9 an expansion cone for expanding a tubular member. Kinley discloses a one piece housing (29) including a tapered first end and a second end. Kinley discloses one or more grooves (37) defined in the outer surface of the tapered first end. Kinley discloses one or more axial flow passages (36;30) defined by the housing fluidically coupled to the circumferential grooves.

As to claim 9, Kinley discloses the grooves comprise circumferential grooves (37).

As to claim 10, Kinley discloses the grooves comprise spiral grooves (30).

As to claim 11, Kinley discloses the grooves (37) are concentrated around the axial midpoint of the tapered portion of the housing.

As to claim 12, Kinley discloses axial flow passages (36) comprise axial grooves.

As to claim 14, Kinley discloses the axial grooves (36) extend from the tapered first end of the body to the grooves (37).

As to claim 15, Kinley discloses axial grooves (36) extend from the second end of the body to the grooves.

As to claim 16, Kinley discloses the axial grooves (30) extend from the tapered first end of the body to the second end of the body.

As to claim 17, Kinley discloses the flow passages (30) are positioned within the housing of the expansion cone (within the outer perimeter thereof).

As to claim 18, Kinley discloses the flow passages (36) extend from the tapered first end of the body to the grooves (37).

As to claim 19, Kinley discloses the flow passages (30) extend from the tapered first end of the body to the second end of the body.

As to claim 20, Kinley discloses the flow passages extend from the second end of the body to the grooves (37).

As to claim 26, Kinley discloses in figure 9 the angle of attack of the first tapered end of the body ranges from about 10 to 30 degrees.

As to claim 27, Kinley discloses the grooves (27) are concentrated in a trailing edge portion of the tapered first end (applicant should note that the recitation "concentrated in" does not convey a structural relationship).

Regarding claims 89, 90, 95 and 96 Kinley discloses an expansion cone (29) body comprising a plurality of adjacent discrete tapered sections (section below and above groove 37) and the angle of attack of the adjacent discrete tapered sections increases in a continuous manner from one end of the expansion cone body to the opposite end of the expansion cone body.

As to claims 91, 92, 97 and 98, Kinley discloses in figure 9 the angle of attack of the outer surface of the paraboloid expansion cone body increases in a continuous manner from one end of the paraboloid expansion cone body to the opposite end of the paraboloid expansion cone body.

Allowable Subject Matter

Claims 34-61 and 99-120 are allowed.

Claims 13, 21-25, 28-33, 64, 66, 69-72, 75, 77, 80-82, 84, 87 and 88 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record does not disclose or suggest all the claimed subject matter including the relationship between the wall thickness t_1 , t_2 and t_{INT} of the first tubular section, the second tubular section, and the intermediate tubular section, respectively, of the tubular member, the inside diameters D_1 , D_2 and D_{INT} of the first tubular section, the second tubular section, and the intermediate tubular section, respectively, of the tubular member, and the inside diameter $D_{wellbore}$ of a wellbore casing that the tubular member will be inserted into, and the

Art Unit: 3672

outside diameter D_{cone} of an expansion cone that will be used to radially expand the tubular member within the wellbore casing is given by the following expression:

$$D_{\text{wellbore}} - 2 * t_1 \geq D_1 \geq 1/t_1 [(t_1 - t_{\text{INT}}) * D_{\text{cone}} + t_{\text{INT}} * D_{\text{INT}}]$$

wherein $t_1 = t_2$; and wherein $D_1 = D_2$.

The prior art of record does not disclose or suggest all the claimed subject matter including the flow passages including inserts having restricted flow passages.

The prior art of record does not disclose or suggest all the claimed subject matter including the flow passages include filters.

The prior art of record does not disclose or suggest all the claimed subject matter including the cross sectional area of the grooves being greater than the cross sectional area of the axial flow passages.

The prior art of record does not disclose or suggest all the claimed subject matter including the angle of inclination of the axial flow passages (30) relative to the longitudinal axis of the expansion cone being greater than the angle of attack of the first tapered end.

The prior art of record does not disclose or suggest all the claimed subject matter including grooves and axial flow passage having a first radius of curvature a first shoulder positioned on one side of the flow channel having a second radius of curvature; and a second shoulder positioned on the other side of the flow channel having a third radius of curvature.

The prior art of record does not disclose or suggest all the claimed subject matter including injecting a lubricating fluid into the trailing edge portion (via 168) of the interface between the tubular member and the cone.

The prior art of record does not disclose or suggest all the claimed subject matter including an annular member, including: a wall thickness that varies less than about 8 %; a hoop yield strength that varies less than about 10 %; imperfections of less than about 8 % of the wall thickness; no failure for radial expansions of up to about 30 %; and no necking of the walls of the annular member for radial expansions of up to about 25%; a method of selecting a group of tubular members for subsequent radial expansion, comprising: radially expanding the ends of a representative sample of the group of tubular members; measuring the amount of necking of the walls of the radially expanded ends of the tubular members; and if the radially expanded ends of the tubular members do not exhibit necking for radial expansions of up to about 25%, then accepting the group of tubular members; if the radially expanded ends of the tubular members do not fail for radial expansions of up to about 30%, then accepting the group of tubular members.

The prior art of record does not disclose or suggest all the claimed subject matter including the grooves being spaced apart by at least about 3 inches in the circumferential direction, and the cross-sectional area of the grooves and axial flow passages ranging from about $2 \times 10^{-4} \text{ in}^2$ to $5 \times 10^{-2} \text{ in}^2$.

The prior art of record does not disclose or suggest all the claimed subject matter including the fluid having a viscosity ranging from about 1 to 10,000 centipoises, nor the fluid being TorqTrim III, EP Mudlib and DrillIN-Slid.

The prior art of record does not disclose or suggest all the claimed subject matter including the wall thickness of the first and second tubular sections being greater than the wall

Art Unit: 3672

thickness of the intermediate tubular section; the outside diameter of the intermediate tubular section ranging from about 75 percent to about 98 percent of the outside diameters of the first and second tubular sections; the ratio of the inside diameters of the first and second tubular sections to the interior diameter of the intermediate tubular section ranging from about 100 to 120 percent; the wall thickness of the radially expanded first and second ends (ends 2) of the tubular member being greater than the wall thickness of the intermediate tubular section; the outside diameter of the intermediate tubular portion ranging from about 75 percent to about 98 percent of the outside diameters of the radially expanded first and second end of the tubular member; the ratio of the inside diameters of the first and second ends of the tubular member to the interior diameter of the intermediate portion of the tubular member ranging from about 100 to 120 percent.

Response to Arguments

Applicant's arguments filed 22 November 2004 have been fully considered.

Applicant argues Abdrakhmanov et al. does not disclose the burst strengths of the first and second ends being equal to the intermediate section.

The cylinder of the prior art will inherently have substantially the same burst strengths in the area between the threaded sections.

Applicant arguments with respect to Simpson are moot in view of new grounds of rejection.

Applicant argues the cased section 11 of Nobileau is not radially expanded.

Nobileau discloses in figure 12 at cross-section 13 expansion of the casing 11.

Applicant argues Kinley does not disclose an axial nor spiral groove.

Diagonal cut 30 is considered to be at least spiral and groove 36 is axial.

Applicant argues Kinley does not disclose tapered sections and similar angles of attack.

Upper and lower halves of the expander are considered to be tapered sections.

Applicant argues Kinley does not disclose a paraboloid expansion cone body.

The sphere of Kinley is considered to be paraboloid, a plane curve formed by the locus of points equidistant from a fixed line and a fixed point not on the line

Conclusion

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David J Bagnell can be reached on 703 308-2151. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Application/Control Number: 10/030,593

Page 13

Art Unit: 3672

6 March 2005

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